asked his staff to analyze the gaps in the availability of environmental health sciences information to the public and developing a plan for implementing the clearinghouse. "The excellent science done at NIEHS is at the heart of our mission, but unless information from our laboratories and our scientists is accessible to a wider public, NIEHS cannot fulfill its mission," Olden said. "The clearinghouse will reach out to environmental journalists, environmental justice organizations, educators, and other target audiences. The public's requests for information and public comments received by the clearinghouse will better enable the institute to respond to the needs of the American people."

When appropriate, the clearinghouse will provide written material describing NIEHS research and training programs, and callers will be referred to other clearinghouses, toll-free numbers, federal, state, and local agencies, and information sources as needed. Full use will be made of various computer networks and the developing information superhighway to make information readily available to the public. The Office of Planning and Communications at the NIEHS has worked closely with Information Ventures, Inc., a Philadelphia-based contractor, to bring the Clearinghouse on-line.

Daniel VanderMeer, director of the NIEHS Office of Planning and Communications, has been the NIEHS project officer for the clearinghouse since the beginning planning stages. "The clearinghouse is designed to expand the lines of communications with other institute programs, our university-based centers across the U.S., the NIEHS Division of Intramural Research, and the National Toxicology Program, for example, to ensure the best possible information on a broad range of issues," VanderMeer said. "A central part of our effort will be to develop communications objectives for the institute and the clearinghouse that are specific, attainable, prioritized, measurable, and time specific."

NIEHS

Money for minority health. John Ruffin (left) director of the Office of Research on Minority Health, and Kenneth Olden, director of the NIEHS.

NTP Announces Bioassay Results

The National Toxicology Program presented six more technical reports in its ongoing series of toxicology and carcinogenesis studies. All six reports were approved by the NTP's Board of Scientific Counselors' Technical Reports Subcommittee in a public review held June 21 at the NIEHS. Each report involves a series of long-term studies in which male and female rats or mice were given a range of doses of test chemical followed by extensive histopathologic examination.

• 1-*trans*-delta-9-tetrahydrocannabinol (THC), the psychoactive ingredient in marijuana, gave no evidence of carcinogenic activity in male or female rats given daily doses of up to 50 milligrams per kilogram body weight for 2 years. In male and female mice, the evidence of carcinogenicity was considered equivocal, based on increased incidences of thyroid gland tumors in animals receiving 125 milligrams per kilogram body weight.

• Acetonitrile, a polar solvent used primarily to extract fatty acids and animal and vegetable oils and for distillation of pharmaceutical products including vitamins and steroids, was tested by inhalation in groups of male and female rats and mice in a series of 13-week and 2-year studies. There was equivocal evidence of carcinogenic activity in male rats based on a slight increase in the incidence of liver neoplasms and no evidence of carcinogenic activity in female rats or in male or female mice.

• Benzethonium chloride, used primarily in cosmetics as a cationic surfactant and an antimicrobial, was tested by dermal application to the backs of male and female rats and mice. Although this regimen resulted in development of epithelial hyperplasia in rats and mice, there was no evidence of carcinogenic activity in either species.

• *t*-Butyl alcohol has a variety of industrial uses, particularly in perfumes and aerosol sprays and in cosmetics, with annual production in the U.S. nearing three billion pounds. This chemical was administered in drinking water to rats and mice for two years. Male rats exhibited some evidence of carcinogenic activity based on increased incidences of kidney neoplasms, but there was no evidence of carcinogenicity in female rats. Male mice had a marginal increase in thyroid gland tumors, which was judged equivocal evidence of carcinogenic activity, while in female rats the increase in thyroid gland tumors was more pronounced and constituted some evidence of carcinogenic activity.

• 1-Amino-2,4-dibromoanthraquinone is one of a series of five substituted anthraquninone dyes that have been studied by the NTP. When given in the feed, this chemical induced large numbers of neoplasms in a variety of tissues, including the liver, intestine, kidney, and urinary bladder in rats and the liver, forestomach, and lung in mice, and was judged to exhibit clear evidence of carcinogenic activity in both sexes of both species. These results were similar to those observed for all the other substituted anthraquinones studied and may permit judgments of the general carcinogenic nature of this class of compounds.

In a different set of studies, the NTP evaluated three mouse strains for sensitivity to the action of known initiators, promoters, and complete carcinogens. $B6C3F_1$ mice, the strain most frequently used in NTP studies, were compared with two strains of mice known to be sensitive to carcinogens, the SENCAR and Swiss (CD-1), in a series of one-year skin paint studies. All three strains of mice developed skin tumors when given a variety of skin carcinogens, with SENCAR mice exhibiting the greatest sensitivity (earlier onset and increased multiplicity). Although $B6C3F_1$

mice exhibited the lowest overall sensitivity to the initiation/promotion protocol, their response was similar to that of the Swiss and SENCAR mice for complete carcinogens.

K-12 Education Grants Awarded

Schoolchildren across the nation will encounter information on environmental health sciences more than ever before in the coming school years, thanks to seven new grants awarded by the NIEHS. The grants correspond to needs and approaches suggested by a select group of K-12 teachers, scientists, and science education program officials at the Environmental Health Sciences Forum held at the NIEHS in December 1992.

NIEHS

Booster club. Marian Johnson-Thompson, associate director for institutional development (center), Michael Galvin (left), and Allen Dearry (right) of the NIEHS played key roles in funding science education grants.

The forum laid the groundwork for the development of a 1993 request for applications entitled "K-12 Environmental Health Sciences Education," directed at funding the development of environmental health sciences materials that could be infused into existing K-12 science curricula on a national basis. The seven grants awarded are described below. Representatives of the projects met at the NIEHS in September, presented their plans and discussed possible collaborations between the projects. This orientation meeting focused on methods of ensuring national distribution of the materials. In addition, awardees will be encouraged to present workshops on their projects at national science teachers' meetings beginning in 1995.

The grants were awarded to the following applicants, given by project title with the name of the project director, the organization receiving the grant, and a brief description of the project.

• *Eco Expert: Health Risks in Our Town*, Paula R. Brady, Texas Learning Technology Group, Austin, Texas. A high quality, multimedia program that includes a computer-based simulation, hands-on activities, discussions, and background print material. Students assume various roles to explore links between environment and health. Classroom implementation involves extensive use of cooperative groups for carrying out research, peer teaching, and decision making.

• *Risky Business: Living in a Chemical World*, David L. Eaton, University of Washington, Seattle, Washington. The University of Washington's Department of Environmental Health and Purdue University's Department of Pharmacology will develop four teaching units to be inserted into existing high school science curricula. These curricular materials will use examples in environmental health sciences to teach basic biological principles and an understanding of environmental health risks.

• *Ozone: Will It Affect Me?* Sarah C. R. Elgin, Washington University, St. Louis, Missouri. The long-term goal of this project is to educate students, teachers, and parents about the potential health effects of ozone, both as a pollutant in the troposphere and as a UV shield in the stratosphere. Students will use information technologies to conduct research, analyze data, develop critical thinking skills, and make discoveries about what scientists do.

• *Toxrap: Toxicology, Risk Assessment, and Air Pollution* Audrey R. Gotsch, University of Medicine and Dentistry of New Jersey, Piscataway, New Jersey. This project will use a participatory action research model to develop educational materials to teach K-8 students about toxicology, risk assessment, and the process of scientific inquiry. Air pollution will be used as a vehicle to teach a framework for understanding and making decisions about environmental health risks.

• *Enviromysteries*, Gail P. Long, Maryland Public Television, Owings Mills, Maryland. Maryland Public Television and the Johns Hopkins University School of Public Health, Center for Environmental Health Sciences, will develop a set of video-based instructional materials for middle school students to encourage individual and group problem-solving related to water and its impact on human health. The set of materials will include a 12-minute core video to model the inquiry process through a detective mystery format and introduce students to broad environmental concepts related to water.

• *My Health, My World*, Nancy P. Moreno, Baylor College of Medicine, Houston, Texas. This project will build upon existing links between the Baylor College of Medicine and local school systems. It uses curriculum materials developed at Baylor to target elementary (K-4) students in an effort to develop in the students a stronger sense of self-involvement in environmental health issues. The program will involve students in school, at home and in their communities by using science adventure stories and coloring magazines. The materials, which will be bilingual, will focus on the role of the personal environment in health and on more global relationships between health and the environment.

• *Environmental Health Science Action Packs*, Claudia K. Probart, Pennsylvania State University, University Park, Pennsylvania. This project will design, produce, and evaluate a package of educational materials for grades 5 through 8. The packages will include instructional modules, interactive computer programs, and videotapes, all designed to be integrated into existing national curricula. Objectives of the materials are to promote awareness of the relationship of the environment to health; increase critical thinking skills; increase interest in environmental science; and provide parental and community involvement.

Dr. Marian Johnson-Thompson, NIEHS director of Institutional Development, who coordinated the Environmental Health Sciences Education Forum, said, "It gives me great pleasure to present forum participants with this end product of a process we began nearly two years ago. That we valued their input and took their suggestions seriously is evident in the nature and quality of the projects."

Alternative Test Systems RFA

A request for applications on the "Development of Mechanistically Based Alternative Methods and Models for Toxicological Research and Testing" was approved at the May 1994 meeting of the National Advisory Environmental Health Sciences Council.

NIEHS has a long-standing commitment to the development of alternative tests. The purpose of the grant is to stimulate expansion of state-of-the-art knowledge and techniques in molecular and cell biology to develop alternative models aimed at improving health hazard identification, species extrapolation, and risk assessment. The official RFA will be available in the fall of 1994. For information on this RFA, please contact the program administrator, Jerrold J. Heindel, PO Box 12233, MD 3-03, Research Triangle Park, NC 27709, (919) 541-0781, FAX (919) 541-2843, Internet: Heindel_j@NEIHS.nih.gov.